Poster Abstracts

Table of Contents

Poster #1
Using Small Area Analysis to Estimate Asthma Prevalence in Chicago Public Schools

Author: Thomas M. Brody, Ph.D., U.S. EPA, Region 5

Keywords: Small Area Analysis, GIS, Schools, Asthma

Background/Purpose: Small area analysis statistics can be used to estimate asthma prevalence in schools from national health data. An initiative is under way to estimate asthma prevalence in a national set of schools while promoting the need for improved asthma surveillance systems.

Objective: To estimate asthma prevalence in Chicago Schools for EPA planning, education, and outreach.

Method: In a pilot study, 1998 National Health Interview Survey data were stratified by age, race, and gender and projected onto Chicago Public Schools demography from the Department of Education's Common Core of Data for the same year.

Results: The estimates were brought into an address matched Geographic Information System of schools for visual interpretation.

Conclusions: These school-based estimates can provide a better point of intervention for local, state, and federal resources and support. An initiative is under way to estimate asthma prevalence in additional sets of schools while promoting the need for improved asthma surveillance systems.

Poster #2
NCEH/ATSDR Geospatial Research, Analysis, and Services Program (GRASP) Environmental Public Health Partnerships

Author: Janet L. Heitgerd, Ph.D., NCEH/ATSDR, Centers for Disease Control and Prevention

Keywords: Geographic Information Systems (GIS), Environmental Health

Background/Purpose: The NCEH/ATSDR Geospatial Research, Analysis, and Services Program has collaborated with numerous environmental public health partners in using geographic information systems (GIS) to better visualize, analyze, and solve environmental public health issues. GIS provides a means to unify disparate data sets having location in common.

Objectives: GIS is a critical tool for public health surveillance and practice. Public health professionals, however, are not always familiar with this rapidly changing technology and do not recognize its wide-ranging applications. Several uses of GIS in public health are presented for a comprehensive understanding of how GIS can be applied to public health.

Method(s): GRASP comprises three operational areas that have complementary functions: 1) Rapid Response and Emergency Preparedness; 2) GIS Systems and Applications Consultation and Integration; and 3) Applied Geospatial Support, Research, and Training. Each of these units has collaborated with various partners to apply GIS in new ways that meet existing needs.

Result(s): The Rapid Response team has supported the CDC Director's Emergency Operation Center by using GIS to assist in response efforts for anthrax, SARS, West Nile virus, and other activities. The Research and Training Team and the Systems and Application Team have partnered with the Migrant Clinicians Network to build an interactive Web-based GIS application to support field clinicians looking for information, tools, referrals, and services in environmental/occupational health for their migrant patients. Other examples will be provided.

Conclusion(s): GIS continues to be a critical tool in understanding and solving public health problems.

Poster #3
Assigning Geographic Coordinates to Unmatched Address Records

Authors: Francis P. Boscoe, Ph.D.; Steve P. Forand, MS; Thomas O. Talbot, MS; Syni-an A. Hwang, Ph.D.; Edward F. Fitzgerald, Ph.D.; New York State Department of Health

Keywords: Geocoding, spatial analysis, probabilistic assignment

Background: Improvements in geographic databases in recent years have made it feasible to assign latitude and longitude coordinates to individuals based on their residential address. Such an approach holds the promise of conducting analyses that are not constrained by political or census boundaries. The key limitation of this approach is that it is difficult to assign coordinates for all data records. Excluding records from a study can introduce substantial selection bias; assigning records to a common location (such as a ZIP code centroid) creates artificial clustering.

Objective: Present a method for assigning coordinates for unmatched address records probabilistically, based on the population distribution of the ZIP code, the distribution of already-geocoded cases in the ZIP code, and the locations of roads.

Method: A random sample of hospitalization records from Albany County, New York were selected. Approximately 80% were assigned latitude and longitude coordinates by matching them to real property parcel records. The remaining 20% were probabilistically assigned coordinates a repeated number of times. The true locations of these cases were then obtained through telephone directories, motor vehicle records, and other sources. The distribution of the probabilistically assigned coordinates was compared with the true locations using several spatial statistical measures.

Result: The data sets containing the probabilistically assigned coordinates did not display significantly different patterns than the data set containing the true coordinates.

Conclusion: Probabilistic assignment of unmatched cases is a viable, labor-saving approach for geocoding large, population-based datasets.

Poster #4
Improving Spatial Resolution of Criteria Air Pollutant Monitoring Data

Authors: Randi Walker, MPH; Sue C. Grady, MPH; Robert Chinery, PE; Steve Shost, MPH; New York State Department of Health

Keywords: Environmental data, criteria air pollutant, air monitoring data, interpolation, co-kriging

Background: The surveillance portion of the New York State Environmental Public Health Tracking Program (EPHT) includes the linking of health effects data (i.e., pregnancy outcomes, and asthma) with ambient, criteria air pollutant concentration data. One problem in assessing the potential relationship between health effects and

criteria pollutants is the low spatial resolution of the pollutant data. This is due to the absence of monitors in many areas of the state.

Objective: Improve the spatial resolution for criteria pollutant data by co-kriging spatially limited air monitoring data and high spatial resolution air modeling data.

Method: The US Environmental Protection Agency's National-scale Air Toxics Assessment (NATA) modeled, at a refined spatial scale, concentrations for a large number of air toxics from a comprehensive emission source inventory. This assessment did not include criteria pollutants. However, criteria and toxic air pollutants are co-emitted from sources such as cars and power plants. Therefore, air toxics were selected from NATA that were highly correlated with monitored criteria pollutants. The relationship obtained by regression between the two pollutants was used to estimate high spatial resolution, criteria pollutant concentrations. These imputed values were co-kriged with actual criteria pollutant monitoring data to produce statewide data with higher spatial resolution than the original monitoring data.

Result: Co-kriging produced high-resolution estimated criteria pollutant concentration data statewide. The resulting data were consistent with a concentration pattern that could be inferred from the location of existing emission point sources and population density.

Conclusion: Co-kriging of criteria air pollutant monitoring data with high spatial resolution air modeling data improved the spatial resolution when compared to the resolution achieved by interpolation of only criteria air pollutant monitoring data.

Poster #5
Air Pollution in New York State: An Environmental Hazard Assessment

Authors: Sue C. Grady, MPH; Sanjaya Kumar, MS; Robert Chinery, PE; Philip Somervell, Ph.D.; Syni-An Hwang, Ph.D.; Edward Fitzgerald, Ph.D.; New York State Department of Health

Keywords: Environmental health, asthma, air pollution, ozone, interpolation techniques, kriging

Background/Purpose: In 2003, the New York State Department of Health was awarded funding by the Centers for Disease Control and Prevention to design and develop a statewide environmental public health tracking system for environmental health surveillance. The focus was on air pollution and childhood asthma. Air monitoring data was used to estimate levels of ozone, sulfur dioxide, and particulate matter between monitoring stations, using a methodology known as kriging. Kriging is an interpolation method that produces estimates of pollution levels by considering global or large trends in addition to local or small scale effects.

Objectives: The objective was to determine the best kriging approach for ozone, sulfur dioxide and particulate matter levels, by minimizing the standard errors of the estimated values.

Methods: Hourly air monitoring data were obtained from the New York State Department of Environmental Conservation for 2002. The data were fit to the best semivariogram model, and estimated values were produced using simple, ordinary, universal, indicator, probability and disjunctive kriging. Pollution data from states surrounding New York State were used to improve border estimates.

Results: We will compare the results obtained by the different kriging approaches, in order to select the optimal method(s) to use for estimating human exposure to ozone, sulfur dioxide and particulate matter across New York State.

Poster #6
Air Quality Characterization for Environmental Health Assessments

Authors: Fred Dimmick[1], BA, MSE, P.E., David Holland[2], Jim Szykman[2], Tim Watkins[2], Vickie Boothe[3], Doreen Neil[4]

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Keyword(s): Air quality, ground level and satellite data, monitoring output, data integration and assimilation, support for public health officials, CDC, NASA, EPA

Background/Purpose: The CDC was given the mandate to develop a National Environmental Public Health Tracking Network (NEPHTN). The NEPHTN will require both environmental and public health data to be "routinely" available at a national scale. Historically, the only source of air quality data that was available on an ongoing and systematic basis at national levels was generated by ambient air monitoring networks put in place for the US EPA's Air Quality Programs. While these networks are being redesigned and updated to address current and anticipated air quality issues, they are still generating routine data. In addition, new data sets are becoming routinely available from air quality models and satellites that can provide additional information to characterize air quality. With the public's expanding interest in the serious health effects associated with ozone and fine particles (and other environmental hazards), public health officials are looking for ways to better use the available air quality data to develop ambient air quality concentration fields for use in the NEPHTN. This effort will pilot development of integrated, geo-coded, air quality data sets, from routinely available sources, for specific use by public health officials (though CDC health assessments).

Objective(s): This project would provide public health-relevant, air quality information to public health officials and health scientists, through any internet browser, for all areas across the U.S.

Method(s): In general, a data set would be built from ambient monitoring data, satellite data, modeling results, emissions data, and other applicable data. The data set would be derived from spatial interpolation and would ultimately provide "continuous" data surfaces for US. Initially, a "test" application would be built with EPA, NASA and CDC distributing data sets through collaboration with State air quality and health departments and the health science community.

Result(s): This project is just beginning. For now, the needed result is "input" from potential users and participants.

Conclusion(s): This project will test the viability, usefulness and scientific uncertainties associated with the methods.

Poster #7
Using GIS in Public Health Decision Making: A Relative Pocket of Need Methodology

Authors: Robert H. Schneider, MS; Benjamin T. Laffoon; Jeff Patridge; Missouri Department of Health and Senior Services

Keywords: Pocket of Need, GIS, Surveillance, Public Health Management, Lead

Background/Purpose: The limits of cost, time, and confidentiality require that new methods be developed for targeted surveillance and intervention using available data to help direct public health efforts. The Relative Pocket of Need (RPoN) methodology represents a new public health approach that allows decision makers to apply funds and surveillance in ways that achieve the best cost-benefit ratio.

Objective: To develop a method of applying funding and surveillance based on the needs of people based on relative need between geographic areas.

Method: The newly developed Relative Pocket of Need Methodology involves processing publicly available data through a relatively simple modular formula to yield a single score for each unique geographic area. These scores represent ordered levels of need that are visualized using GIS.

Results: Calculated scores for the State of Missouri have been mapped and are available for management's use in program planning.

Conclusions: The Relative Pocket of Need Formula functions by keying management into key areas of need while controlling for area and weighting by population. The relative pocket of need methodology performs well if factors of relevance are properly selected.

Poster #8:
GIS-Based Spatial Search for Environmental Health Research: Environmental Hazards and Birth Defects in Texas

Authors: F. Benjamin Zhan, Ph.D.; Jean Brender; Lucina Suarez; Peter Langlois; Ionara De Lima; Yaowen Han; Texas State University

Keyword(s): GIS, Spatial Analysis, Environmental Health, Birth Defects, Epidemiology

Background/Purpose: A team of researchers have been studying the relationship between residential proximity to environmental hazards and congenital malformations in offspring in Texas. In this study, it is necessary to perform spatial search to determine the distances between environmental hazardous sites and the residential locations of the mothers of the cases and controls because distance is used as the measure of exposure in the study.

Objective(s): The goal of the project reported in this poster is to develop a geographic information system (GIS) that can be used to facilitate spatial search and determine the distances between environmental hazardous sites and the residential locations of the mothers of the cases and controls.

Method(s): The authors developed the GIS within the ArcGIS environment. The GIS consists of two major components: (1) a spatial search tool implemented with Visual Basic programming and ArcObjects; (2) geodatabases containing the locations of environmental hazardous sites, cases, and controls. The spatial search tool is a menu-driven and interactive software package that can be used to find the cases and controls within a given distance of a hazardous facility or site. The locations of environmental hazardous sites, cases, and controls were obtained through geocoding.

Result(s): The GIS can be used to interactively and automatically determine the distance between any possible pair of environmental hazardous sites and cases/controls.

Conclusion(s): GIS is indeed a powerful tool for spatial search when distance is used as a measure of exposure in environmental health research. The reported system should be useful to researchers facing similar situations in environmental health studies.

Poster #9
Arsenic in Drinking Water Data Linkage with Tumor Registry Data for New Mexico

Authors: Helen Flowers, MS NMDOH; Amy Lay, M.S.; Shirley Baros, MS

Keywords: Arsenic, Cancer, Surveillance

Background/Purpose: The New Mexico Department of Health, through an Environmental Health Tracking 2 cooperative agreement with the CDC, is conducting a study to demonstrate and evaluate methods for establishing a statewide environmental health surveillance system to monitor cancer incidence rates according to arsenic drinking water levels. The purpose of this data linkage is to increase the understanding of the relationship between health and environmental exposures through enhanced surveillance and standardized data system integration.

Objectives: (1) Demonstrate the utility of the linked data for surveillance purposes by conducting ecologic analyses of cancer incidence rates according to drinking water arsenic levels. (2) Demonstrate the utility of the linked data analyses in guiding public health practice and policy regarding public concerns about arsenic and cancer. (3) Evaluate potential for expansion of the data linkage capacity to additional drinking water contaminants.

Methods: (1) Compile and geocode the regulatory compliance monitoring data for arsenic in municipal wells for statewide analyses of arsenic in drinking water and cancer risk at the census tract level. (2) Establish Technical Advisory Committee. (3) Initiate the project with the selection of four diverse pilot sites to explore methods for estimating exposures. (4) Utilize GIS technology to facilitate and promote data linkage, data analysis, and data visualization, and (5) Perform epidemiologic analysis of cancer incidence rates according to drinking water arsenic levels.

Results: Current status of the project includes the review and geocoding of arsenic data in municipal wells and tumor registry data at the cenusus tract level. The exposure assessment of arsenic in drinking water at the census tract level is being developed at four pilot sites.

Conclusion: Ongoing study

Poster #10
Accommodating Rate Instability for Small Areas in Disease Mapping

Authors: Daniel Wartenberg, Ph.D.; Gerald Harris; Ling Shen; Environmental and Occupational Health Sciences Institute

Keywords: Disease Mapping; Smoothing; Aggregation; MAUP

Background/Purpose: Disease mapping methods are often used to describe and summarize geographic patterns of disease. Theoretically, to achieve the most accurate and precise map, one uses data at the smallest geographic scale available. In practice, both population and disease data are often reported for political units such as towns, zip codes and counties, and these define the unit of analysis. Some units have small populations and are extremely sensitive to variations of just a few cases of disease. This can result in misleading interpretations and inappropriate statistical comparisons of rates if not adjusted.

Objective: To compare some aggregation and smoothing methods for creating disease maps that overcome the statistical instability concerns that arise from small populations. We want to assess which methods capture the overall pattern most accurately and which methods best preserve the extreme values.

Methods: We examine several methods that aggregate neighboring regions in an arbitrary order until they achieve a minimum population size, ones that achieve a minimum population size by aggregating regions that are similar in terms of possible confounding variables, and also smoothing approaches, such as empirical Bayes.

Results: Results are compared for both simulated and real data. Strengths and weaknesses of smoothing versus aggregation are discussed and recommendations are provided.

Conclusions: Alternative methods different views of the data. Depending on a user's purpose, one may want to choose an approach that is most response to that aspect of the data that is of most interest.

Poster #11
A Priori Estimation as a Cornerstone of Signal Recognition

Author: Tim E. Aldrich, Ph.D., MPH, University of Louisville School of Public Health

Keyword(s): Pattern Recognition, Surveillance, Empirical Bayesian Estimation

Background/Purpose: Analyses of surveillance data face many methodological challenges. Among the most daunting is the reconciling of statistical precision for decision making purposes, and signal recognition. The fundamental epidemiological step of 'observe a statistical association' is complicated by the pseudo precision achieved with enormous sample sizes [e.g., state-level data] when it is partitioned into smaller strata, e.g., geographic, personal, or temporal. Similarly challenging, but conversely applied is the artificial precision generated by 'Texas Sharp-shooter' cluster analyses.

Objectives: This paper will discuss and illustrate a progressive approach for serial estimation [described in diverse applications by various terms] that permits a very satisfying signal detection performance.

Methods: The approach follows an empirical Bayesian strategy utilized in multiple other contexts, but currently no widely for public health studies.

Results: Diagrams and graphic models will be presented for illustration of the analytic principles. Examples of productive analyses from rare, and pediatric cancers will be illustrated, as well as colon cancer, breast cancer, and asthma

Conclusions: One certain difficulty is the aspect of multivariate studies, and the complexity of presentation of results in community-based settings. However, cancer registry studies have pioneered the essential responsibility of public health to provide local statistics, and to interpret observations for community-level assessment.

Poster #12
Defining Hazards and Exposure for Health Tracking

Authors: Thomas E. McKone, Ph.D., MS, BA; John Balmes; John R. Froines; University of California, Berkeley

Keywords: Hazard tracking, exposure tracking, exposure databases, Bayesian methods

Background/Purpose: The complexity of the disease/environment link makes tracking environmental hazards that contribute to disease both important and difficult. "Hazard" refers to the potential for harm. Characterizing the potential for harm does not necessarily express the likelihood or severity of harm. Public health researchers acknowledge that human diseases, particularly chronic diseases, are multi-factorial and that environmental exposures are significant contributing factors to many diseases.

Objectives: To address these issues, we assess current and potential approaches for detecting, tracking, and ranking population exposures to potentially harmful substances. We first consider the capabilities and limitations of the existing framework and available data for establishing hazard and the relationship of hazard to actual exposure and intake.

Methods: We identify a number of available data sets that provide for the US population exposure indicators for toxic substances. But these data have not been evaluated for use in health tracking. As an alternative approach to existing methods, we introduce general Bayesian methods and Bayesian melding as tools to integrate these limited data with empirical and process models.

Results: We provide examples of Bayesian melding techniques using exposure tracking for benzene, dioxin compounds, and organophosphate pesticides. In the alternative approach, we recognize a continuum from source to exposure, intake measures (biomarkers), and health outcomes. In spite of their uncertainties, models are useful for exploring this continuum.

Conclusion: We find that Bayesian methods can enhance the reliability of limited data when these data are used to constrain the output of models—even when the uncertainty in both data and model are large.

Poster #13
Approaches for Evaluation of Multiple Source, Population-Based Surveillance of the Autism Spectrum Disorders (ASDs) in the United States

Authors: Kim Van Naarden Braun, Ph.D.; Jon Baio; Joyce Nicolas; Michael Brimacombe; Russell Kirby; Sydney Pettygrove; Nancy Doernberg; Catherine Rice; and the ADDM CADDRE Network, National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention

Keywords: Autism Spectrum Disorders, Surveillance, Evaluation

Background/Purpose: In recent years, there has been public concern about possible increases in the prevalence of Autism Spectrum Disorders (ASDs). To address this concern, the Centers for Disease Control and Prevention (CDC) recently established a collaborative, national network to monitor the prevalence of ASDs in children. The Autism and Developmental Disabilities Monitoring (ADDM) Network and the Centers for Autism and Developmental Disabilities Research and Epidemiology (CADDRE) include 16 sites in 18 states. Differences in methodology between past studies have made direct comparison of past prevalence estimates difficult. An important aspect of identifying all children with an ASD is ensuring that identification of potential cases is as complete as possible. Evaluations of completeness of case ascertainment and data quality are being conducted to ensure comparability of this common methodology and accuracy in prevalence estimates.

Objectives: To evaluate the quality and completeness of data collected using multiple-source population-based surveillance methods for identifying children with ASDs within a set of specific catchment areas.

Methods: The evaluation of the ADDM/CADDRE Network surveillance system will use qualitative and quantitative approaches including: conducting stakeholders' working groups and surveys, use of the Network's data collection instrument to identify new providers, and capture- recapture and sensitivity analyses to evaluate the impact of missing cases on prevalence estimates. A three-tiered training and evaluation process should maximize quality and accuracy in data collection.

Results: Using prevalence and sample size estimates from prior CDC surveillance data, the planned evaluations assess the potential impact on the robustness of prevalence estimates across a range of reasonably expected outcomes. Preliminary findings from initial data quality evaluations will be presented.

Conclusion: The design of evaluation plans for population-based surveillance poses numerous challenges. However, thorough evaluation will help to ensure comparability of prevalence estimates across multi-site surveillance networks.

Poster #14
Overview of Methodology for Multiple Source, Population-Based Surveillance of the Autism Spectrum Disorders (ASDs) in the United States ADDM CADDRE Network

Author: Jon Baio, Ed.S., National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention

Keywords: Autism spectrum disorders, surveillance, prevalence estimates

Background/Purpose: Autism spectrum disorders (ASDs) are defined by unusual and pervasive developmental problems in social interaction, communication, imagination and range of interests or behaviors. Both the epidemiology and etiology of these serious developmental disorders are poorly understood. Estimates of population prevalence vary widely within the U.S. and abroad. Two primary factors contributing to this wide variation in prevalence estimates are 1) differences in case finding and ascertainment methods, and 2) lack of standardization in evaluating diagnostic criteria for ASDs. A more precise estimate of the public health impact of ASDs would serve to inform appropriate and well-coordinated responses by planners at the local and national level.

Objectives: The 18-state ADDM CADDRE Network is implementing multiple-source surveillance methods to determine population prevalence and characteristics of ASDs and other developmental disabilities.

Methods: The ADDM CADDRE Network is conducting active ASD surveillance that does not rely on professional or family reporting of children's recorded ASD classification and/or diagnosis. Rather, children's files are abstracted at multiple clinical and educational sources and systematically reviewed by an independent team of clinicians in order to determine case status.

Results: This poster illustrates the Network's methodology for identifying suspected cases, abstracting source records, and determining case status. Challenges and accomplishments in database development and training are also described. Selected process evaluation data are presented.

Conclusion: Coordinated public health surveillance of ASDs provides an ongoing source of high-quality data to examine the magnitude and characteristics of ASDs in the population. This activity will inform appropriate responses to community and political concerns, promote planning for health and educational services, and generate descriptive data that can foster continued research on ASDs.

Poster #15
Surveillance for Asthma Using Emergency Department Data in South Carolina

Author: Deborah Hurley, MSPH, University of South Carolina, School of Public Health

Keyword(s): Asthma Epidemiology, Surveillance, GIS

Background/Purpose: From 1997 to 2002, the Asthma Surveillance Project has studied asthma admissions in South Carolina. Primary as well as secondary admissions are included with the data files, also both Emergency Department [ED] presentations as well as hospitalizations. File management and manipulation methods for such an enormous data asset have been challenging, as have analytic approaches.

Objectives: We aspired to perform analyses related to health care access, environmental pollutants, seasonal and locale-specific effects. System studies were also nested for quality and completeness as well as studies of health status indicators, and sentinel events.

Methods: We have drawn extensively from Geographic Information System techniques, sequentially partitioning the data set, as well as decomposing age-strata.

Results: The poster will describe some of the logistical issues of ED-based surveillance as well as model solutions. Also, we will present a variety of prototypic analyses and data presentation styles for illustration of the wealth of surveillance products that these medical record systems may pose.

Conclusions: Massive numbers of products and findings have been achieved and are in preparation for publication. These analyses have permitted a very satisfying signal detection performance from this secondary database, with this disease: asthma.

Poster #16
Preventing Occupational Illness Through Insurance Claims Analysis

Authors: Andrea R. DeVries, PhD; Brian Day; Highmark Blue Shield; Tim Bushnell; Ahmed Gomaa; Michael D. Attfield; Eva Hnizdo; Deborah D. Landen; Centers for Disease Control and Prevention

Keywords: Public Health and Environmental Partnerships, Occupational Illness, Insurance Claims Analysis, Surveillance

Background/Purpose: Cases of many occupational diseases are vastly under-recognized and under-reported. In partnership, the National Institute for Occupational Safety and Health (NIOSH) and Highmark Blue Shield are developing a method for assessing the potential magnitude of occupational health problems and of using data to guide and motivate prevention of disease by employers.

Objective: To determine whether health insurance claims data can be used to identify industries with elevated risk of occupational illnesses.

Method(s): Eight diseases with known or suspected connections to occupational exposures were selected: COPD, asthma, bladder cancer, Parkinson's disease, carpal tunnel syndrome, hearing loss, dermatitis, and pneumoconiosis. Prevalence rates for selected diseases were calculated by age category and industry for workers who remained insured within the same industry code during 2000-2002.

Results: Several industries with known exposures related to occupational illness were identified. For example, mining industries had elevated rates of respiratory diseases such as COPD and coal workers' pneumoconiosis, and mining and fabricated structural metal industries had elevated hearing loss rates.

Conclusions: The data are effectively identifying industries with unusually high rates of specific chronic illnesses, some clearly occupational in nature. More analyses are needed to estimate the extent to which instances of high industry rates may be explained by non-occupational factors such as gender, smoking, and local air quality. Claims data, which includes zip codes, could be used for environmental health tracking and improve its quality by controlling for occupational exposures.

Poster #17
Using the BRFSS for Exposure Tracking: Experiences from Environmental Health BRFSS Questions in Washington State

Authors: Denise Laflamme, MS, Washington State Department of Health; Jim VanDerslice, Ph.D., Senior Epidemiologist

Keywords: Surveys, Exposure Assessment, BRFSS

Background/Purpose: BRFSS can be used to gather information on behaviors, attitudes and knowledge and results of these types of questions can be applied to environmental health (EH) issues. Information on behavior can provide crucial information for assessing environmental exposures. Attitudes and knowledge about environmental health hazards can aid in the development of programs to prevent exposures.

Objectives: To evaluate the usefulness of state-added EH questions.

Method: Since 1990, Washington State has implemented ten state-added modules focused on environmentally related behaviors, attitudes and knowledge. Usefulness was gauged by the actual uses of the generated and the perceptions of Department of Health EH managers.

Results: In this poster we present the results and evaluate the usefulness of questions on 5 topics: perceptions of environmental problems, drinking water, fish consumption, outdoor air quality, and radon. In 1995, respondents were asked to identify environmental quality problems in their community. Outdoor air quality was identified the most frequently (22%) as being a problem in their community while home indoor air quality was identified the least frequently (5%). In 1990, 81% of survey respondents agreed that "exposure to radon gas is harmful", which decreased to 68% in the 1997 survey. In 2002, respondents reported eating canned tuna and store-bought fish an average of 7.4 and 2.8 times per month, respectively, and 31% reported being aware of official advice about eating fish.

Conclusions: BRFSS questions that have collected information on behaviors and knowledge have provided useful information for exposure assessment and for designing and evaluating prevention strategies. BRFSS questions that address attitudes alone have provided less useful data.

Poster #18
Canned Tuna Mercury Levels and Consumption Patterns in Washington State

Authors: Jim VanDerslice, Ph.D.; Helen Murphy; Glen Patrick; David McBride; Stuart Magoon; Washington State Department of Health

Keywords: Mercury, fish tissue contamination, exposure assessment, BRFSS

Background/Purpose: Canned tuna is the most frequently consumed fish. As part of the fish tissue-birth defects demonstration project of the Environmental Public Health Tracking Network, we found that there was a significant knowledge gap about the levels of mercury (Hg) in canned tuna.

Objective: (1) To estimate the mean concentration of Hg different types of canned tuna. (2) To estimate exposures to Hg via the consumption of canned tuna.

Methods: A stratified sample of 289 six oz. cans of tuna were collected from 83 randomly-selected retail outlets. Type was defined by three factors: species (albacore white vs. light), cut (solid vs. chunk) and packing (oil vs. water). Tuna was analyzed for total Hg using EPA method 245.5. The frequency and amount of canned tuna consumed was estimated from 2002 BRFSS state-added questions.

Results: Albacore tuna had an average of 215 parts per billion of mercury (95% CI 191 – 238), compared to an average of 57 ppb (95% CI 51 – 63) in canned light tuna. There were no significant differences between solid and chunk tuna, or between tuna packed in water versus oil. Approximately one-fifth of women of child-bearing age ate canned tuna more than once per week. Average consumption was 3.5 oz. per sitting. About 15% of young children ate tuna more than once a week with an average meal size of 2 oz.

Conclusion: Consumption of "light" canned tuna would result in significantly lower exposures to Hg as compared to albacore "white" tuna.

Poster #19
Evaluating the Impact of a West Nile Virus Education and Outreach Campaign in Kansas: Implications for Environmental Public Health Education

Authors: Michael H. Fox, Sc.D., School of Medicine, University of Kansas Medical Center; John Neuberger, Ph.D.; Ellen Averett, Ph.D.

Keyword(s): West Nile Virus; Outreach; Health Education

Background/Purpose: Each year, states spend public health dollars and resources on West Nile Virus (WNV) public education, yet little is known about the efficacy of these efforts. Facing a greater than expected outbreak of WNV in Kansas in the summer of 2003, the Kansas Department of Health and Environment contracted with researchers from the Kansas University Medical Center to investigate the impact of an extensive outreach and education campaign they had used.

Objective(s): Specific questions the investigators sought to answer involved knowledge, attitudes and behavior of Kansans towards WNV and the possible influence of methods to protect themselves from contracting this disease.

Method(s): Evaluation methods were multimodal, employing a household phone survey, media survey, business partners' survey, and interviews at senior centers and retirement communities in random but representative counties. The phone survey had a final sample of 534.

Result(s): Findings indicated widespread understanding of both the disease and its method of transmittal, though the impact of public service announcements and printed material were minimal. Seniors' acquisition of preventive behaviors were best acquired in common meeting areas, such as lunch settings, while most frequent sources of information came from national news. While 48% of persons claimed to use insect repellant, we found widespread concern about the safety of DEET that the outreach campaign appeared to fall short in addressing. Messages which emphasized the importance of wearing long sleeves were reported as impractical in a state having many areas of high summer temperatures and evening humidity.

Conclusion(s): Recommendations were to center future WNV educational campaigns on paid announcements or prominent news feeds, engage speakers to spread the message, and limit the production of printed material that few people read or respond to.

Poster #20
Utilization of the Toxic Exposure Surveillance System for Detection of Potential Chemical Terrorism Events

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Keywords: Surveillance, Poisonings, Chemicals

Background/Purpose: The Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, and the American Association of Poison Control Centers are collaborating to improve public health surveillance of health hazards associated with chemical exposures using the Toxic Exposure Surveillance System [TESS]. Developed in 1983, TESS is a national, real-time surveillance database that contains toxicological information about more than 33 million poison exposures reported to U.S. poison control centers.

Objective: TESS is used to facilitate the early recognition of illnesses associated with a chemical release by monitoring the daily clinical effects reported to TESS.

Methods: Computer generated, daily surveillance is conducted on each clinical effect (N=131). The frequency of each clinical effect over a 24-hour interval is compared with a historical baseline. The historical baseline is defined as the mean frequency for each clinical effect during the two week period surrounding the 24-hour interval, over the preceding three years. An aberrancy is identified when the observed number of cases with a given clinical effect exceeds the expected limit (historical baseline + two standard deviations). Cases identified through this system are evaluated and respective poison control center(s) are contacted if unusual patterns in location, substance, or outcome are noted.

Results: Aberrancies have alerted us to clusters of clinical effects occurring within a 24-hour period. Further investigation of these cases has identified a group of cases with a single etiology (e.g. 16 cases of severe gastrointestinal illness from intentional tampering of coffee with arsenic at a church picnic).

Conclusion: Detection of these aberrancies suggests that surveillance using TESS can identify illnesses resulting from intentional or unintentional chemical releases that occur at a single site and potentially across multiple locations.

Poster #21
A Model Sentinel Event Surveillance System in Louisville, KY

Author: Matthew Groenewold, MSPH, Louisville Metro Health Department

Keyword(s): Sentinel Health Event, Surveillance, Mortality-based, Coroner

Background/Purpose: Some recent literature suggests that sudden deaths have the potential to signal tragic or catastrophic events. This may encompass deaths among 'normally health persons,' death under suspicious circumstances, as well as deaths when the immediate cause of death is not apparent. In Louisville, it is to these sudden deaths that county coroners are dispatched to investigate. An enormous archive of such investigations is present for development of a priori trends and patterns.

Objectives: We have implemented a data collection system using field abstraction with electronic devices to expedite reporting of these deaths, and their descriptive characteristics.

Methods: Such a rapid-reporting capability is vastly superior to awaiting death certificate reporting, or compiled reports for state agencies. The merit of local data collection is patent for concerns of population security and rapid response.

Results: This talk will describe the coroner-based system, its elements and operation. A series of model analyses will be presented to depict simulation of real-time signal detection.

Conclusions: This innovative approach to sudden, and sentinel event surveillance may assist with discerning seasonal or locale-specific determinants of disease and mortality.

Poster #22
Environmental Health Information Resources: NLM's Toxicology and Environmental Health Information Program

Authors: Stacey J. Arnesen, MS, AB, National Library of Medicine, Specialized Information Services; Jeanne C. Goshorn

Keywords: Environmental health information; databases

Background/Purpose: Bridging the gap between public health and the environment is an important goal of the environmental health tracking network. The availability of reliable, timely information is vital in obtaining this goal. The Internet is replete with environmental health sites, but with so many available, it can be difficult to identify high-quality, accurate information oriented towards the specific needs of varied user groups.

Objective: The National Library of Medicine (NLM) is home to the Toxicology and Environmental Health Information Program (TEHIP), an organization that creates and disseminates scientific and consumer level health information (http://tox.nlm.nih.gov). This poster demonstrates the application of NLM's environmental health databases as fundamental resources for the environmental health tracking network.

Method: The integration of information from multiple resources and unique features of each are highlighted.

Results: Featured resources include:

- TOXNET (http://toxnet.nlm.nh.gov), a network of toxicology and environmental health databases including the Hazardous Substances Data Bank and TOXLINE
- Haz-Map (http://hazmap.nlm.nih.gov), an occupational health database
- Tox Town (http://toxtown.nlm.nih.gov), an interactive guide to potentially hazardous substances in the environment
- TOXMAP (http://toxmap.nlm.nih.gov), maps showing the location of toxic releases
- Household Products (http://householdproducts.nlm.nih.gov), a database of household products, their chemical ingredients, and health and safety warnings from labels and Material Safety Data Sheets
- WISER, Wireless Information System for Emergency Responders, a resource for identifying hazardous chemicals and providing immediate and succint health and safety information during emergencies
- ToxSeek, a pilot metasearch tool allowing users to search multiple websites and databases from diverse sources simultaneously, with relevance ranking and focusing capabilities.

Conclusion: These resources are valuable tools for understanding, communicating, and tracking environmental health issues.

Poster #23
Use of Existing Databases for the Purpose of Hazard Identification: An Example

Author: Dina M. Schreinemachers, DrPH, MS, U.S. EPA

Keywords: existing databases, hazard identification, cancer mortality, birth malformations

Background: Associations between adverse health effects and environmental exposures are difficult to study, because exposures may be widespread, low-dose in nature, and common throughout the study population. Therefore, individual risk-factor epidemiology may not be the right tool. A better method is provided by a series of multidisciplinary studies, starting with an hazard identification study, such as an interregion comparison. This presentation shows how existing databases routinely collected by Federal Agencies can be used for the purpose of hazard identification.

Objective: Spring and durum wheat grown in the U.S. are mostly produced in Minnesota, Montana, North Dakota, and South Dakota. Chlorophenoxy herbicides are the predominant herbicides used on these crops. Since information on chlorophenoxy herbicide use per county is not available, wheat acreage per county is used as a surrogate exposure measure. Associations of cancer mortality and birth malformation rates with wheat acreage per county were investigated.

Methods: Cancer mortality for 1980-89 deaths and birth malformation for 1995-97 births were extracted from existing databases maintained by NCHS. Agricultural information was obtained from the USDA website. Only rural, agricultural counties were included in the study. Analyses were performed based on individual or grouped counties, depending on the levels of adverse health outcomes.

Results: Increasing wheat acreage per county was observed to be associated with increasing rates of cancer mortality and birth malformations.

Conclusions: Results show that existing databases, despite their limitations, can be used for the purpose of hazard identification.

This is an abstract of a proposed presentation and does not necessarily reflect EPA policy.

Poster #24
If Follow-up Is Needed for Pesticide Epidemiology Findings: Would Community HANES Help?

Authors: Ruth H. Allen, Ph.D., MPH[1]; Carol Christensen, MPH[1]; Margaret G. Conomos, MPH[2]; Gauthami Gondy, MD[3]; David T. Mage, Ph.D.[3]

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[3]Institute for Survey Research, Temple University

Keywords: Pesticide epidemiology, Agricultural Health Study (AHS), childhood leukemia, prostate cancer, lymphohematopoietic cancer, Long Island Breast Cancer Study Project (LIBCSP)

Background/Purpose: The purpose is to advance understanding of the interface between health and environmental indicators for general and occupational exposure to pesticides.

Objectives: The objectives are to examine statistical and geographical information analysis issues and gaps in four pesticide epidemiology case studies linking environment and health outcomes, and evaluate ways that a community HANES approach will fill gaps.

Methods: This analysis evaluates four case studies that include readily available biomonitoring data and published pesticide epidemiology findings. This poster will outline a Community HANES framework.

Results: The cases are: (1) Children's Health and Leukemia-Ashtabula and Summit Counties, Ohio; (2) Women's Health and Breast Cancer- (LIBCSP mandate) Nassau and Suffolk Counties, New York; (3) Agricultural Health Study [IA & NC] findings of prostate and lymphohematopoietic cancer; and, (4) Pesticide

epidemiology literature, including pesticide-specific acute poisoning surveillance data, and NHANES pesticide biomonitoring data.

Conclusions: Key conclusions relevant to a Community HANES framework are: (1) a skill mix gap, with the need for pro-active use of epidemiology and statistical interns, trainees, and rotations; (2) need for more comparisons of biomonitoring and survey results over time, leading to targeted Community HANES protocols; (3) changes over time in metrics, e.g., in limits of detection, and metrics of choice; (4) relevance of medians, high exposure events, metabolite vs. parent compounds as analytes and multiple parent compounds; (5) mean values influences by outliers (statistical concept) represent real people (with potential for biological consequences); and, (6) the need to distribute "teaching" document on pesticide epidemiology as issues arise, and briefings are requested, e.g., Purdue pesticide epidemiology pamphlet.

Poster #25
Cancer Prevention Through Risk Characterization: Environmental Mapping of Sources of Exposure to Cancer Causing Agents in Maryland

Authors: Shannon Brown*, Amir Sapkota†, Timothy Buckley†, Thomas Burke*

Johns Hopkins University Bloomberg School of Public Health
*Department of Health Policy and Management
†Department of Environmental Health Sciences

Keywords: Cancer, Risk, Mapping, Maryland

Background/Purpose: Maryland has the unfortunate distinction of being ranked number three among U.S. states for estimated cancer risk due to air toxic ambient concentrations. Exposure to environmental carcinogens is of particular concern in Baltimore City where the cancer mortality rate (255 per 100,000) is significantly higher than that for the State of Maryland (191.4 per 100,000) while Maryland's cancer mortality rate is significantly higher than that of the rest of the United States (172.8 per 100,000) (Maryland Cancer Consortium, 1996). Moreover, Baltimore City ranked as number one for "added cancer deaths attributable to air toxics" with an estimated risk of 970 in a million excess cancer deaths (Woodruff et al. 1998; Caldwell et al. 1998; Rosenbaum et al. 1999). Human exposure to cancer causing agents in the environment is believed to be a contributing factor to the observed higher urban rates.

Objectives: The goal of this project is to provide a framework for understanding and preventing environmentally related cancers in the state of Maryland.

Methods: This will be accomplished by: 1) developing a framework for assessing both exposure and cancer mortality and incidence rates; 2) identifying sources, mapping exposures, and identifying communities at risk; 3) building an infrastructure for measuring environmental carcinogens, assessing risk, and supporting community, exposure, and epidemiological research; and 4) providing hypothesis generating data for prevention and intervention strategies.

Results/Conclusions: By evaluating both the geographical distributions of environmental carcinogens and cancer mortality and incidence rates for the state of Maryland, insights can be gained regarding at risk populations and effective prevention strategies.

Poster #26
Multi-Disciplinary Model to Investigate Environmental Threats to Children's Health

Authors: Julie Herbstman^, Kristen Chossek-Malecki*, Lynn Goldman†, Adrienne Ettinger*, Thomas Burke*

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Keywords: Children, Health Indicators, Thyroid

Background/Purpose: In the United States today, environmental public health practice lacks fundamental tools to assess baseline trends, monitor for environmental public health outcomes, and investigate emerging environmental threats. Environmental public health indicators and epidemiological methods are tools that can help to fill these gaps. This project will apply these tools to develop a framework to address potential environmental public health threats to children. The lessons learned will then be applied to further advance the development of a national environmental public health tracking network.

Objectives: The goal of this project is to develop and apply a model to investigate potential environmental threats to children's health using environmental public health indicators and epidemiologic methods. The case example will be PCB and PBDE exposure in relation to birth weight, gestational age, and infant thyroid hormone levels.

Methods: This will be accomplished by 1) selecting and evaluating relevant environmental public health indicators; 2) applying these indicators to an epidemiologic framework; 3) conducting an epidemiologic study; and 4) applying the results from the investigation to environmental public health tracking.

Results/Conclusions: For this case study, the following indicators will be considered: PCB in fish and PCB and PBDE in umbilical cord blood, birth weight (for gestational age), preterm birth, and thyroid hormone levels. The epidemiologic investigation will relate PCB and PBDE exposure indicators to the health outcomes indicators (birth weight, gestational age, and thyroid hormone levels). The results of this investigation will be applied to the development of an environmental public health tracking network. Using lessons from this multi-disciplinary methodology, policy makers and practitioners will be provided with a framework to address other potential environmental public health threats.

Poster #27
Investigating Preterm Births and Air Pollution in Michigan

Authors: Robert L. Wahl, DVM, MS, Michigan Department of Community Health; Alireza Sadeqnejad; Mary Lee Hultin; Stuart Batterman; Michael Depa; Julie Wirth

Keywords: Preterm Birth, Air Pollutants

Background/Purpose: Exposure to ambient levels of carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 2.5 μ ($PM_{2.5}$) and sulfur dioxide (SO_2) have been associated with adverse birth outcomes.

Objective: To assess the potential effects of certain air pollutants on preterm births (PTB, < 37th gestational week) in Michigan.

Methods: A semi-individual study was designed to merge databases containing 1990-2001 CO, NO_2, O_3, $PM_{2.5}$ and SO_2 measurements from air-monitoring sites in Allen Park (AP), Lansing (LA) and East Seven Mile (E7) and Linwood (LI) in Detroit with a database containing corresponding individual-level birth certificate information. The study area involves 36 ZIP Codes that are within a 4-kilometer radius of an air-monitoring site. Birth certificate data from 207,481 singleton live births that weighed 750-4000g, had a gestational age of 20-40 weeks and whose mother was 16-45 year old at the time of birth were included in the study. PTB risk

factors assessed in the study include maternal race, residence, education, disease history, smoking and previous adverse pregnancy outcomes.

Results: The ratio of African-American/Caucasian and percentage of PTB was 6/100 and 16.0% in AP, 25/100 and 17.0% in LA, 186/100 and 23.2% in E7 and 317/100 and 25.3% in LI. Mean gestational age was approximately 37 weeks at each site.

Conclusions: In accordance with previous studies, a greater percentage of PTB was found in the areas with larger African-American populations including E7 and L1. Risk factors in each study area will be described further. Using regression analysis, relationships between PTB and exposure will be assessed for each pollutant individually and all pollutants collectively while controlling for risk factors.

Poster #28
America's Children and the Environment: Measures for Tracking Children's Environmental Health

Authors: Tracey J. Woodruff, PhD, MPH, U.S. EPA; Daniel A. Axelrad; Amy D. Kyle; Onyemaechi Nweke; Gregory Miller

Keywords: Tracking, children, indicators, measures, environmental health, biomonitoring, environmental contaminants, childhood illnesses.

Background: Measures for tracking children's environmental health bring together quantitative information on health and environment for monitoring trends in factors important in protecting children's health from environmental impacts, which can be used to identify opportunities and needs for interventions or policy. Selection of measures must consider both the scientific information and the needs of the decision making process.

Objectives: To develop a set of key national measures for tracking children's environmental health in three areas: environmental contaminants; body burdens; and childhood illnesses that may be influenced by exposure to environmental contaminants.

Methods: Three principal criteria were used to select measures: 1) importance to the health of children, 2) availability of data for much or all of the United States, and 3) sufficient quality of data to generate a reliable measure. The specific methods for selecting and constructing the measures will be presented.

Results: Measures for environmental contaminants reflect potential exposures of children to outdoor and indoor air pollution, drinking water contaminants, pesticides, and land contaminants. Measures for body burdens represent direct exposures of lead and cotinine measured in children's blood, and mercury measured in blood of women of childbearing age. Measures for childhood disease reflect adverse health outcomes that may be influenced by exposure to environmental contaminants and include asthma and other respiratory diseases, childhood cancer, and neurodevelopmental disorders.

Conclusions: Overall, while many children's environmental health measures show improvements, some percentage of children remain at elevated risk. These measures are quantifiable and useful for monitoring trends relevant to the environment and children in the US.

Views presented are of the authors and not necessarily of US EPA or other organizations.

Poster #29
Catching Your Breath: Strategies to Reduce Environmental Factors that Contribute to Asthma in Children

Authors: Henry Anderson, MD; Daniel Luttinger, Ph.D., MBA; Claire H. Prince, JD; Kristin J. Ryan, MS; Monty Elder, MS, REHP; William A. Vance, Ph.D.; Jean Woodward ; Lynn Schuster, RN, BSN, MSN; Patricia I. Elliott, JD, MPH ; A. Christine Eppstein, LL.B, LL.M ; Amy D. Kyle, Ph.D., MPH; Becky Smullin, MPH

Keywords: Asthma, Children, State, Environmental Agency, Health Agency, Coordination, Partnership

Background/Purpose: The Environmental Council of the States (ECOS) and the Association of State and Territorial Health Officials (ASTHO) sponsored an initiative beginning in August 2001 to jointly identify steps that state health and environmental agencies can take to address environmental factors that contribute to asthma in children. Funding for this effort was provided by the U.S. Environmental Protection Agency and the Centers for Disease Control and Prevention.

Objective: To bring together state health and environmental agencies to identify, develop, and evaluate strategies that reduce environmental factors that contribute to asthma in children.

Methods: The *Catching Your Breath: Strategies to Reduce Environmental Factors that Contribute to Asthma in Children* report was developed through a national conference and a series of workshops involving more than 250 individuals, including representatives from state health and environmental agencies, as well as federal agencies, non-governmental agencies, and other groups.

Results: In May 2003, the *Catching Your Breath: Strategies to Reduce Environmental Factors that Contribute to Asthma in Children* report was completed. The report provides a menu of concrete workable actions states can take to reduce environmental factors that contribute to asthma in children. It specifically addresses the need for greater communication and coordination between state health and environmental agencies.

Conclusions: The results of *Catching Your Breath* reflect an integration of the disciplines and capabilities of state health and environmental agencies and have applications to the development of the National Environmental Public Health Tracking Network.

Poster #30
Environmental Health Indicators: State of the Environment Report

Author: Rebecca L. Calderon, Ph.D., MPH, U.S. EPA

Keywords(s): Indicators, Health, Exposure

Background/Purpose: The U.S. Environmental Protection Agency (EPA) is moving in the direction of measuring and assessing human health and ecological outcomes. The new "outcome" measures complement the more traditional approaches by more closely reflecting the actual public health or ecological impacts that result from environmental quality/conditions.

Objectives(s): A draft report was released in 2003 that describes what EPA knows and doesn't know, identifies measure/indicators to report on status of national environmental conditions, trends and their impacts on human health and the nations's natural resources and discusses the challenges that the nation faces in improving these measures. By providing a quantitative assessment of these impacts, outcome indicators can help to improve environmental decision-making and enhance our ability to evaluate, either prospectively or retrospectively, the success of those decisions.

Methods: Key data sources used for the health chapter include the:

- *World Health Organization (WHO), World Health Statistics Annual,*
- *National Center for Health Statistics,*
- *Centers for Disease Control and Prevention, National Notifiable Diseases Surveillance System,*
- *National Cancer Institute, Surveillance, Epidemiology, and End Results Program,*
- *The EPA's National Human Exposure Assessment Survey (NHEXAS),*

Results: Key indicators were either health outcome indicators (mortality or morbidity) or exposure indicators (biomonitoring). Examples of key indicators include cancer, cardiovascular and asthma mortality, blood lead, cotinine and selected pesticide levels and specific indicators for children such as birth defects, low birth weight and children blood lead levels.

Conclusions: Continued effective coordination and collaboration among such agencies will be vital to further the development and use of environmental public health indicators.

Poster #31
Environmental and Health Risk Communication in a Fenceline Community

Authors: L.E. White, Ph.D., Tulane School of Public Health and Tropical Medicine; E.C. Langlois, MSPH; M. Brown, MSPH; C. Shorter, MPH; F.J. Mather, Ph.D.; J. Shaffer

Keywords: Risk communication, risk perception, air quality monitoring

Background/Purpose: A pilot study to develop and evaluate methods for linking environmental, exposure and health data as a basis for communication strategies is underway with a fence-line community in Norco, LA. Residents live adjacent to major petrochemical refining plants and are concerned about the impact of air on their health. An air monitoring protocol to conduct air sampling and analysis was developed in 2002 through a community/industry/agency/academic partnership.

Objectives(s): Using the results from air monitoring and a health and environment perception survey, design, implement and evaluate communication strategies to: a) communicate air sampling results; b) respond to community concerns and questions about air quality and health; and c) develop environmental and health education with the community.

Methods: In Spring, 2003, a health and environmental perception survey was mailed to 1200 households in Norco, LA. Additionally, a formal air sampling program began in March, 2003 to collect air samples throughout Norco over a two year period.

Results: Approximately 30% of the households responded to the health and environmental perception survey. Eighty three percent (83%) of the respondents had somewhat to major concerns about the air quality in Norco. Additional environmental concerns were explosions, unpleasant odors, loss of wildlife, and leaking gasoline. The top five health concerns were cancer, exposure to chemicals, heart problems, asthma, and getting sick. The air monitoring detected low levels compounds, all below regulatory standards.

Conclusions: Based on the results of the survey and six months of air monitoring results, monthly fact sheets are developed with the residents to address their top six health and environmental concerns. Input from community members is solicited to make the materials relevant to the community.

Poster #32
Using Existing NGO Collaborations to Expand Public Health Awareness and Tracking Opportunities: A Case Study

Authors: Jackie Hunt Christensen, David Wallinga, Kathleen Schuler, Institute for Agriculture and Trade Policy

Keywords: Non-Governmental Organizations; Parkinson's Disease; Non-Hodgkin's Lymphoma; Agriculture; Public Health

Purpose: The Collaborative on Health and the Environment (CHE) is a nonpartisan partnership working to further knowledge, action and cooperation regarding environmental contributors to disease and other health problems. In November 2002, Midwestern members of CHE began planning a regional conference.

Objectives: to bring representatives from rural communities, agriculture, public health, state agencies, environmental groups, health-impacted organizations, and the scientific community.

Methods: The Institute for Agriculture and Trade Policy recruited co-sponsors American Academy of Neurology, Community Alliances for Interdependent AgriCulture, Dakota Rural Action, Parkinson Associations of Minnesota and South Dakota, Women's Cancer Resource Center. Sponsors contacted members and media, ran ads in newsletters and community newspapers, circulated 5,000 brochures and innumerable e-mails.

Results: The "Exploring Environmental Links To Disease: A Look At Parkinson's Disease And Non-Hodgkin's Lymphoma" conference was a 1-1/2 day event in Sioux Falls, SD on December 4-5, 2003 with national and local speakers, with brainstorming sessions for follow-up. Nearly 100 farmers, health-impacted individuals, state agency staff and rural residents participated. Attendance by health professionals was not as strong as we had hoped. However, representatives from Iowa State University, University of Nebraska and CHE convened in January 2004 to discuss ways to educate medical and agricultural students on environmental links to chronic illnesses and making informed occupational decisions.

Conclusions: Efforts to educate medical and agriculture students should continue, but integrated education may be difficult. Outreach to other constituencies should also continue.

Poster #33
Johns Hopkins Center for Excellence in Environmental Public Health Tracking

Author: Beth A. Resnick, Johns Hopkins Centers for Excellence in Environmental Public Health Tracking and Community Environmental Health Practice

Abstract: Environmental public health tracking provides a framework for identifying and monitoring sources of harmful pollutants, measuring population exposures, and assessing key health indicators in the population. The work of the Pew Environmental Health Commission at the Johns Hopkins School of Public Health, including findings regarding key measures of health and environment, resulted in Congress funding the CDC to develop a comprehensive nationwide environmental public health tracking network and to increase environmental public health capacity within state and local health departments. The Johns Hopkins Center for Excellence in Environmental Public Health Tracking activities, as part of this national effort, will be highlighted in this poster. This poster will also highlight the efforts of Hopkins' multi-disciplinary faculty and staff to strengthen the environmental health workforce through training and education; provide technical assistance and research support for the development of the Network; and conduct research to investigate links between the environment and health effects.

Poster #34
Assessing and Prioritizing Stakeholders Needs for Environmental Public Health Tracking

Authors: Barbara Malczewska-Toth, MS, Ph.D., DABT; Amy Lay, MPH; David Coffey, D.Min (Cand.), LPC

Keyword(s): Environmental health needs assessment, environmental public health indicators

Background/Purpose: Presentation demonstrates strategies for enhancing environmental health (EH) capacity for tracking environmental exposures and related health outcomes.

Objective(s): Develop processes (1) assessing and prioritizing EH needs/gaps of data users and other stakeholders, (2) forming recommendations for addressing these needs/gaps, (3) examining feasibility of using environmental public health indicators (EPHIs) for tracking environmental exposures and related health effects.

Method(s): NMDOH has engaged County, Tribal, and Pueblo Health Councils in the assessment and prioritization of EH needs/gaps of stakeholders. A protocol for systematic assessment and prioritization was developed requiring participating councils to (1) attend a training, (2) hold public meeting(s), (3) develop and prioritize appropriate EPHIs for tracking environmental exposures and related health outcomes. Indicators will be incorporated into their community health profiles. NMDOH used the PACE-EH to guide the Councils' activities.

Result(s): Staff introduced the assessment project to statewide Leadership of the Community Health Councils at their quarterly meetings. The leaders were invited to recommend to their councils that they contract for the assessment protocol. Twenty-three Councils agreed to participate. A training curriculum was developed for assessing community EH. Three trainings were provided to the Council representatives, Environment Department staff, Public Health Division central and district staff, and the Indian Health Service. Over 120 people attended. Councils will hold a publicized community meeting(s) to discuss and document the EH needs/gaps. They will then examine and prioritize these needs/gaps using criteria to determine which issues can serve as EPHIs. A priorities' report with documentation as to how the priorities were developed will be used to advance the EPHI project.

Conclusion(s): The approach and strategies implemented are expected to result in increased collaboration between New Mexico communities, public health, and environmental agencies.

Poster #35
Stakeholder Participation in Environmental Public Health Tracking: Results and Feedback from California's Pilot Project

Authors: Michelle Wong, MPH; Eric M. Roberts, MD, Ph.D.; Craig Wolff, MS Eng; Paul English, Ph.D., MPH; Catalina Garzon, MS; Jaclyn Kohleriter

Keywords: Environmental Public Health Tracking, Pilot Project, Stakeholder Participation, Community Partnerships, Environmental Justice

Background: The California Environmental Health Tracking Program (CEHTP) Pilot Project is linking birth outcomes, asthma, and traffic pollution data for Alameda County in 2001.

Objectives: Recruit appropriate individuals to participate in a series of stakeholder meetings. Present environmental health tracking and the Pilot Project results. Assess the utility of results and identify additional data elements and analyses, as well as appropriate data presentation and dissemination methods.

Methods: CEHTP worked with community-based organizations (CBOs) to build rapport, gain insight to community concerns, and identify other key stakeholder participants. CEHTP then partnered with a respected non-governmental organization (NGO) to recruit stakeholders and convene the first stakeholder meeting.

Results: Eighteen representatives from CBOs, NGOs, health care providers, health departments, city council members, and the EPA participated in the meeting. The group learned about the CEHTP and the Pilot Project. Participants identified information needs, potential uses for and barriers to accessing the data, and concerns about the results through structured, facilitated feedback activities. Participants indicated results could be used to facilitate community organizing, advocacy, education, and planning. Temporal analysis and inclusion of urban planning, economic, and healthcare information were identified as useful additions. Preferred methods for accessing the results included the Internet, an interactive GIS interface, and printed reports.

Conclusions: Key activities for convening knowledgeable, diverse stakeholders included establishing partnerships, investing resources and time in community activities, and utilizing community expertise. Initial feedback indicated Pilot Project results will be useful to stakeholders. Input from the stakeholder meetings will guide the development and dissemination of Pilot Project materials and facilitate the development of a statewide tracking network.

Poster #36
Understanding Community Environmental Health Data Needs Through Partnership

Authors: Michelle Chuk, MPH, Physicians for Social Responsibility; Daniel Kass, MPH, Ph.D., New York City Dept. of Health and Mental Hygiene; Wendy Child, MSc; Nancy Jeffery

Keywords: Community needs assessment; environmental health; urban public health

Background Purpose: The purpose of this presentation is to highlight work being done in partnership between the New York City Department of Health and Mental Hygiene and Physicians for Social Responsibility to help the city better understand how community based and other organizations utilize and view environmental health data. In-depth interviews are being conducted with individuals representing various organizations.

Objectives: The objectives of this partnership are to:

- Understand the mission, nature and major initiatives of current and potential "users" of environmental health data.
- Explore how organizations perceive environmental and health issues in NYC.
- Discuss how organizations currently generate or use data or could use and/or link environmental and health data to support their initiatives.
- Obtain feedback on the NYC Environmental Public Health Tracking Initiative.

Methods: Twenty in-depth interviews were conducted with city organizations representing diverse missions, including: policy research, legal advocacy, medical research and advocacy, environmental justice, neighborhood housing advocacy and others.

Results: Several common themes emerged from the interviews. Three such themes include:

- Acknowledgement of the importance and utility of access to an inventory of environmental public health data sources.
- Desire for greater flexibility in the selection of geographic boundaries in the reporting of New York City data.
- Need for conceptual and analytic assistance in making maximum utility of existing data and data anticipated to be made available by public health tracking.

Conclusions: These findings will help to guide the New York City Department of Health's effort to build capacity, monitor environmental health data and provide more accessible, useable information to constituents. A final report that includes operational recommendations will be completed by Spring 2004.

Poster #37
A Conceptual Design for the New Mexico EPHT System

Authors: Chandra L. Bales; Shawn L. Penman, Ph.D.; Barbara Malczewska-Toth, Ph.D., DABT; Gina Aranda

Keywords: Environmental health surveillance; system prototype

Background/Purpose: The New Mexico Department of Health is developing an Environmental Public Health Tracking (EPHT) System Plan as part of the national CDC program. This presentation illustrates and defines a prototype for the proposed surveillance System.

Objectives: The proposed System will be capable of linking health effects data with human exposure and environmental hazards data for surveillance and hypothesis generation. Its objectives are to provide an interactive application for tracking environmental factors and related diseases, and to present information for planning, applying, and evaluating interventions to control or prevent those diseases.

Methods: The System prototype will be an interactive, Web-based application that will allow users to request data and to perform queries and analyses on linked environmental and health datasets. It will include toolkits for data exchange, integration, and analysis, including a Geographic Information System for exploring spatially-referenced data. There will also be toolkits for results visualization and reporting. The application will be standards-based, interoperable with other systems, and compliant with the CDC Public Health Information Network and EPA Exchange Network. User access will involve tiered permissions, based on "who needs to know."

Results: A Conceptual Design for the New Mexico EPHT System Plan has been completed. This first-stage document and the consortium of partners and collaborators will guide the planning for the System, and will indicate those areas for which information gaps exist. The System prototype will be essential to evaluate the Plan and the feasibility of the Internet application.

Conclusions: The prototype application outlined in this presentation incorporates all of the major components of the proposed New Mexico EPHT System, and demonstrates the power of Internet-accessible surveillance.

Poster #38
Automated Data Exchange System for Environmental Public Health Tracking Network in New York State: Functions, Specifications and Applications

Authors: Linh H. Le, M.D., MPH, New York State Department of Health (NYSDOH; Leslie Brennan, P.E., New York Department of Environmental Conservation (NYSDEC); Ivan Gotham, Ph.D., NYSDOH; Philip Somervell, Ph.D., NYSDOH; Debra Sottolano, Ph.D., NYSDOH

Keywords: Information Technology, Data Exchange, Electronic Surveillance, Web Service

Background: Rapid and secure electronic interchange of information between New York State Department of Health (NYSDOH) and its public health partners including New York State Department of Environmental Conservation (NYSDEC) is essential to the timely detection, response and abatement of disease outbreaks in addition to the tracking of environmental hazard exposures and adverse health effects. As a part of the EPHT grant project, NYSDOH proposed to study the feasibility of and plan for developing an automated data

exchange system between NYSDOH and NYSDEC that will automate secure exchange of health data between NYSDOH and NYSDEC.

Objectives: The goal of this project is to develop a Pilot Data Exchange System between NYSDOH and NYSDEC using PHINMS v2.0 and the Exchange Network Node architecture, conduct functional and performance testing including regression and longevity tests, and to explore interoperability issues between the EPA Exchange Network and the PHINMS. The data exchange system will be used to automate transport air monitoring data from NYSDEC to NYSDOH for the original EPHT grant project and look to extend that to a complimentary data flow.

Method: The system was developed based on Public Health Information Network (PHIN) Standards and Specifications v1.2 in particular Function 1: The Automated Exchange of Data between Public Health Partners as well as EPA Exchange Network Node framework.

Poster #39
Application for Assessing Environmental Public Health Indicators

Authors: Jim VanDerslice, Ph.D., Washington State Department of Health; Asnake Hailu

Keywords: EPHI, fish tissue contamination, birth defects

Background/Purpose: CDC and CSTE developed a set of Environmental Public Health Indicators (EPHI). These indicators can be used to track changes in hazards, exposures, protective efforts and health outcomes. As part of the Cooperative Agreements, an evaluation of the feasibility and utility of the EPHIs was included as a required activity.

Objective: The objective of this effort was to develop a framework and simple database application to facilitate the assessment of EPHIs.

Methods: Washington State developed a common framework for their assessment of the EPHIs. These elements were formulated into an Access® database to guide the assessment and facilitate easy retrieval and comparison of the EPHI assessment results. Fish tissue contamination indicators and birth defect indicators were evaluated using the application.

Results: Fish tissue contamination indicators and birth defect indicators were evaluated using the application. The application will be available for demonstration and comment.

Conclusion: The application may facilitate consistent evaluation of the EPHIs.